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REMARKS

Applicant gratefully acknowledges the Examiner's allowing the pending claims 1-19, 21-23, 26-36, and 50-54. However, the previously indicated allowability of claims 24-25 and 37-39 has been withdrawn in view of the newly discovered reference to Beck et al. (US 5,403,800) and Plank et al. (US 4,341,748). Claims 1-19, 21-23, 26-36, and 50-54 are allowed.

Claim Rejections -35 USC 103

Examiner's position:

A. Claims 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beck et al. in view of Plank et al. and Felder et al. In particular, the Examiner alleges that Beck et al. (US 5,602,066) discloses a method for producing a selectivated zeolite catalyst. According to the Examiner, the method comprises the steps of: (a) contacting a catalyst comprising an intermediate pore size zeolite, such as ZSM-5, with an organosilicon compound under conditions sufficient to deposit a siliceous material on the catalyst; (b) calcining the organosilicon containing material in an oxygen containing atmosphere under conditions sufficient to remove organic material therefrom and leave the siliceous material on the catalyst; (c) directly washing the catalyst from step (b) with water; and (d) drying the washed catalyst from step (c) (columns 17-18, claim 1). It is

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taught that steps (a) and (b) are repeated at least once and further that step (c) is repeated at least once (column 18, claims 8 and 9, column 2, lines 43-45, and column 4, lines 50-56). Furthermore, the Examiner alleges that with regards to step (a) above, the organosilicon compound may be water soluble or water insoluble (column 4, lines 55-65 and column 5, lines 60-65). Examples of suitable compounds include silanes (column 5, lines 25-30). The organosilicon compound is present in the form of an organic carrier or water (column 4, lines 55-65). The use of 7.8wt% of organosilicon compound in decane is exemplified (column 15, Example 1). In an example, following step (a), Beck et al. teaches that the solvent is stripped (Example 1). With regard to steps (c) and (d), Beck et al. teach washing the catalyst in water, followed by drying and calcination at a temperature of at least 200°C for at least one hour to more completely remove the residue of the liquid medium used to treat the catalyst (column 3, lines 40-50). In an example, Beck et al. teaches that washed extrudates are dried for 4 hours at 120°C and calcined at 300°C for 2 hours (column 15, Example 3).

In the opinion of the Examiner, Beck et al. disclose the present catalyst including a binder material such as alumina, or silica, or alumina in combination with silica (column 14, lines 42-56).

However, the Examiner admits that in contrast to the instant claims Beck et al. does not disclose specifically that the solvent is recovered or that the

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zeolite comprises Ga-ZSM-5 or GaAl-ZSM-5. The Examiner seeks a remedy to this deficiency by relying on Plank et al. (US 4,341,748) to disclose that ZSM-5 may be prepared having Ga in the ratios required by the instant claims. Refer to columns 2-3.

The Examiner alleges that it would have been obvious to one having ordinary skill in the art at the time the invention was made to have substituted the Ga-ZSM-5 or Ga-Al-ZSM-5 disclosed by Plank et al. in the process taught by Beck et al. specifically referring to the zeolites taught by Plank et al. as suitable (column 3, lines 55-65 of '066), thereby giving one of ordinary skill motivation to use either, with a reasonable expectation of success.

With respect to the solvent recovery, The secondary reference to Felder et al. (*Elementary Principles of Chemical Processes*) discloses any reactant that is fed into a system and is unused represents wasted money. The reference proposed that if one could find a way to separate most or all of the unconsumed reactant from the product stream, one could then recycle the unconsumed reactance back to the reactor. While one would have to pay for the separation and recycle equipment, this would be offset by having to purchase less fresh reactant. Refer to page 106. It would have been obvious to one having ordinary

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skill in the art at the time the invention was made to further modify the method Beck et al. in light of the teachings of Felder et al. to recover the solvent stripped from the selectivated catalyst such as for recycle. One would have been motivated to do so because of the teaching by Felder et al. that such a recovery/recycle is conventional and would result in a more economical process, i.e. one would not continually need to supply fresh solvent to the selectivation process.

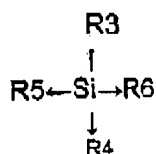
B. Claims 24-25 are rejected under 35 U.S.C. 103(a) as being obvious over Beck et al. '800 in view of Felder et al. In particular, the Examiner contends that Beck et al. (US 5,403,800) disclose a method for producing a selectivated zeolite catalyst comprising the steps of contacting a catalyst of an intermediate pore size zeolite, such as ZSM-5, with an organosilicon compound in a solvent under conditions sufficient to deposit a siliceous material on the catalyst, calcining the organosilicon containing material in an oxygen containing atmosphere under conditions sufficient to remove organic material therefrom and leave the siliceous material on the catalyst (column 5, lines 10-35). The reference discloses that contacting with the organosilicon compound are repeated at least once (column 5, lines 20-30).

Furthermore, the Examiner alleges that the organosilicon compound may

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be water soluble or water insoluble (column 5-6). Examples of suitable compounds allegedly include silanes (column 6, lines 25-45). In the opinion of the Examiner, the silanes are characterized by the following general formula:



where R₃, R₄, R₅ and R₆ are independently selected from the group consisting of hydrogen, hydroxyl, halogen, alkyls, halogenated alkyl, alkoxy, aryl, halogenated aryl, aralkyl, halogenated aralkyl, alkaryl, halogenated alkaryl and organoamine groups. Most preferably R₃, R₄, R₅ and R₆ are independently selected from the group consisting of —N(CH₃)₃, —N(C₂H₅)₃ and —N(C₃H₇)₃. Mixtures of these compounds may also be used (see column 6, lines 30-46).

The difference between the reference and the instant claims is that the reference does not disclose the specific silanes required by the claims or that the solvent is recovered. The reference allegedly discloses a generic chemical formula and substituents which would meet the instant claims. The claims differ from the reference by reciting a specific species and a more limited genus than the reference. However, it would have been obvious to one having ordinary skill in the art at the time of the invention to select any of the species taught by the reference, including those of the claims, because in the Examiner's opinion an ordinary artisan would have the reasonable expectation that any of the species of the genus would have similar properties and, thus, the same use as the genus as

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a whole.

With respect to the solvent recovery, Felder et al. (*Elementary Principles of Chemical Processes*) proposed that if one could find a way to separate most or all of the unconsumed reactant from the product stream, one could then recycle the unconsumed reactance back to the reactor. While one would have to pay for the separation and recycle equipment, this would be offset by having to purchase less fresh reactant (page 106).

Thus the Examiner contends that it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the method of Beck et al. in light of the teachings of Felder et al. to recover the solvent stripped from the selectivated catalyst such as for recycle; and one would have been motivated to do so by Felder et al. that such a recovery/recycle is conventional and would result in a more economical process, i.e. one would not continually need to supply fresh solvent to the selectivation process.

Applicant's Response:

Applicant respectfully disagrees. On the contrary, the cited

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references, taken alone or combined, do not disclose or even remotely suggest the inventive process as presently claimed. In fact, Applicant asserts that the rejection under 35 U.S.C. § 103(a) of the claim 24, 25 and 37-39 is improper. Moreover, Examiner has provided inadequate motivation for the combining the references cited against the claims, to the contrary, a person of ordinary skill in the art when viewing the claim as a whole would not find any of these claims obvious over the references taken alone or in combination...

Applicant respectfully asserts that the Examiner's reasoning for rejecting these claims is based on a flawed understanding of the invention, and the embodiments asserted in the claims. In the first instance, the presently amended claims 24 and 25 as well as 37-39 are directed to a process for preparing a catalyst composite by the sequential steps of contacting a porous metallosilicate with an organosilicon compound in a solvent and combining this mixture with water, repeating this sequence as often as desirable, and finally calcining the product appropriately without recycling the first two steps of treatment.

In determining that the only difference between the claimed subject matter of independent claims 24, 25, 37 and 39, Beck '066 resides in the recovery of solvents, the Applicant respectfully asserts that Examiner misreads the claimed embodiments. *Inter alia*, the novelty of these claimed embodiments upon avoiding multiple calcination during the multiple silanation procedure (see page 5, paragraph 5, lines 4 -6 and page 10, last paragraph, of the specification of the application). To emphasize this difference in regard to the particular embodiments of the invention presently being sought the

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Independent claims have been amended to recite that the applicable calcination step is not repeated after each impregnation step. The references cited by the Examiner make clear a fundamental belief by those in the prior art— that is, that calcination should occur after each impregnation (See Beck '066 at column 3, lines 65 - 67; column 4, lines 1 to 9; column 4, lines 46 to 51; column 6, lines 5 - 8; and column 6, lines 34 — 39, claims 1, 8 and 9). Respectfully, the embodiment asserted is a radical departure from the prior art belief that calcination at the end of each impregnation was essential to the salination process. Each of the claims 24, 25, 37 and 39 avoid multiple calcination during multiple silanation procedures. The avoidance of calcination not only improves efficiency of the silanation process, but results in avoiding effluents, saves material and energy costs, and provides higher para-selectivity in the para-xylene production process (see examples in the specification of the patent application).

Thus, Applicant respectfully asserts that independent claims 24, 25, 37 and 39, as presently amended, are free of the cited prior art in disclosing processes that avoid calcination after each impregnation. For this reason alone, regardless of Applicant's traverse with respect to lack of motivation for combining references to teach the recovery of the solvent, the presently amended claims 24, 25, 37 and 39 are deemed patentable. In as much as independent claim 37 is patentable over the cited art, claim 38, dependent therefrom, is also deemed allowable.

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CONCLUSIONS

Accordingly, it is respectfully submitted that the claims under consideration are clearly patentable over the references of record. It is submitted that the above-identified patent application is in condition for allowance. Early notification of the allowability of the pending claims is courteously solicited.

The Commissioner is authorized to charge payment of any fees that may be required 37 C.F.R. §1.16 in connection with this paper transmitted herewith, to Deposit Account No. 03-3975.

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Respectfully submitted,


Hans-Peter Hoffmann, Reg. No. 37,352
Agent for Applicant
Pillsbury Winthrop
Financial Centre, 695 East Main Street
Stamford, CT 06904-6760
Tel.: (203)965-8271
Email: hhoffmann@pillsburywinthrop.com

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